

Notice of Allowability

Application No.

10/799,859

Examiner

Anne M. Hines

Applicant(s)

TSUKAMOTO, TAKEO

Art Unit

2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amendment filed 9/29/2006.
2. ☒ The allowed claim(s) is/are 40-62.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

DETAILED ACTION

Response to Amendment

The amendment filed on September 29, 2006, has been entered and acknowledged by the Examiner.

Claims 40-62 are pending in the instant application.

Allowable Subject Matter

Claims 40-62 are allowed.

The following is a statement of the Examiner's reasons for allowance:

In the response of September 29, 2006, Applicant argues on page 10, line 6 to page 11, line 18 that the primary reference in the 103(a) rejection of independent claims 40, 42, 52, and 58 (Hsu et al.: US 6333598, hereafter 'Hsu') of the office action mailed June 29, 2006 that the emitters disclosed by Hsu only emit electrons from the ends of the emitters (e.g. carbon nanotubes) and that therefore one of ordinary skill in the art would not combine the invention of Hsu with the nanofibers comprising graphenes stacked in various configurations disclosed by Rodriguez since the graphenes of the nanofiber emit electrons along the length of the nanofiber.

This is persuasive. In addition to only disclosing emitters that emit electrons from the end of the nanofiber, Hsu further discloses that the ends of the emitters protrude above gate electrode to prevent the electrons emitted from the emitter from shorting with the gate electrode and to direct the electrons emitted toward the anode (Column 1, lines 31-55; Column 10, line 39 to Column 11, line 17). By having the nanofibers of Hsu

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replaced as the nanofibers with graphenes disclosed by Rodriguez, electrons would be emitted from the graphenes at locations other than only above the gate electrodes, contributing to shorting of the emitter with the gate electrode.

Regarding independent claim 40, the references of the Prior Art of record fail to teach or suggest the combination of the limitations as set forth in claim 40, and specifically comprising the limitation wherein a method of manufacturing a device with a substrate with first and second electrodes comprises arranging a plurality of carbon fibers on the first electrode so that a height of at least a part of the carbon fibers from the substrate is larger than a height of the second electrode from the substrate, wherein each carbon fiber has a plurality of graphenes stacked in a direction different from a direction perpendicular with respect to an axis direction of each carbon fiber.

Regarding claims 41-45, claims 41-45 are allowable for the reasons given in claim 40 because of their dependency status from claim 40.

Regarding independent claim 46, the references of the Prior Art of record fail to teach or suggest the combination of the limitations as set forth in claim 46, and specifically comprising the limitation wherein a method of manufacturing a device with a substrate with first and second electrodes comprises arranging a plurality of carbon fibers on the first electrode so that a height of at least a part of the carbon fibers from the substrate is larger than a height of the second electrode from the substrate, wherein each carbon fiber comprises a plurality of stacked graphenes intersecting with an axis of the carbon fiber.

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Regarding claims 47-51, claims 47-51 are allowable for the reasons given in claim 46 because of their dependency status from claim 46.

Regarding independent claim 52, the references of the Prior Art of record fail to teach or suggest the combination of the limitations as set forth in claim 52, and specifically comprising the limitation wherein a method of manufacturing a device with a substrate with first and second electrodes comprises arranging a plurality of carbon fibers on the first electrode so that a height of at least a part of the carbon fibers from the substrate is larger than a height of the second electrode from the substrate, wherein each carbon fiber has a plurality of graphenes, and the graphenes are stacked along an axis direction of the carbon fiber.

Regarding claims 53-57, claims 53-57 are allowable for the reasons given in claim 52 because of their dependency status from claim 52.

Regarding independent claim 58, the references of the Prior Art of record fail to teach or suggest the combination of the limitations as set forth in claim 58, and specifically comprising the limitation wherein a method of manufacturing a device with a substrate with first and second electrodes comprises arranging a plurality of carbon fibers on the first electrode so that a height of at least a part of the carbon fibers from the substrate is larger than a height of the second electrode from the substrate, wherein each carbon fiber has a plurality of graphenes, and the graphenes are stacked so as not to be parallel to an axis direction of the fiber.

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Regarding claims 59-60, claims 59-60 are allowable for the reasons given in claim 58 because of their dependency status from claim 58.

Regarding independent claim 61, the references of the Prior Art of record fail to teach or suggest the combination of the limitations as set forth in claim 61, and specifically comprising the limitation wherein a method of manufacturing a device with a substrate with cathode and gate electrodes on the surface of the substrate, comprises forming a plurality of carbon fibers on the cathode electrode so that the distance of at least a part of the carbon fibers from the anode is smaller than the distance of the gate electrode from the anode, wherein each carbon fiber has a plurality of graphenes, and the graphenes are stacked so as not to be parallel to an axis direction of the fiber and stacked in the axis direction of the fiber.

Regarding claims 62, claims 62 are allowable for the reasons given in claim 61 because of their dependency status from claim 61.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anne M. Hines whose telephone number is (571) 272-2285. The examiner can normally be reached on Monday through Friday from 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Anne M Hines
Patent Examiner
Art Unit 2879

AmH
12/11/06

msl
MARICELI SANTIAGO
PRIMARY EXAMINER